THE DELAWARE AND HUDSON RAILROAD BULLETIN

IN THE RED ROCKS
NEAR WILLSBORO, N.Y.

"The D&H"

DECEMBER 1, 1932

Christmas

GOD bless all givers and their gifts.
And all the giftless, too,
And help them by whatever shifts
Their kindly will to do.
When seasons, which our hearts expand.
Our purses fail to fill,
A word, a smile, a clasp of hand
Shall carry our good-will.

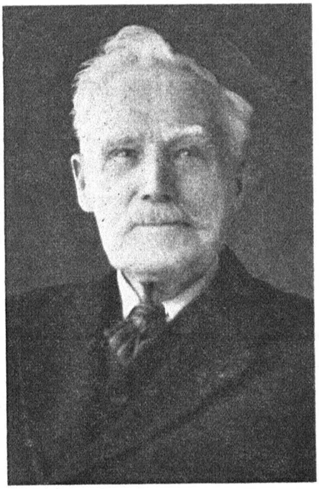
Let him who hath his plenty share.
And him who lacks, his lack,
Give, each one, what he may, nor care
What recompense comes back.
If only love his heart shall swell
And kindness guide his hand,
His Christmas he shall keep as well
As any in the land.

—E. S. MARTIN.

The
DELAWARE AND HUDSON RAILROAD
CORPORATION
BULLETIN

Smuggled Into This Country

Martin E. Dwyer Fled Bondage on Canadian Farm to Start Railroad Career



MARTIN E. DWYER

WHEN President Abraham Lincoln signed the bill which set the standard railroad track gauge at 4 feet 8½ inches, in 1862, thus terminating the bitter battle between rival interests, there were fourteen other gauges in use in the United States and territories which later became parts of the Union, ranging upward from three to six feet.

On what is now our own Pennsylvania Division, as has been stated at different times in *The Bulletin*, the steam railroad tracks were of the present standard width, while the rails on the Gravity were only 4 feet 3 inches apart. Three rails and stub end switches were used to accommodate cars with different truck widths on the same right of way.

MARTIN E. DWYER, retired roadmaster, who first worked for a railroad at the age of 14, in 1868, recalls a most ingenious system for gaining a similar end at Ogdensburg, N. Y., where cars coming from the wide (6 foot) gauge tracks of the Grand Trunk at Prescott, were ferried across the St. Lawrence, delivered to the standard gauge Ogdensburg and Lake Champlain Railroad, and run over a two-rail track to Rouses Point and Champlain, N. Y. Although only the oldest of veterans on our northern divisions saw the following practice in actual operation, MR. DWYER'S remarkable story has been verified by others who know it was done.

The wheels on the Grand Trunk's six-foot trucks were not fixed as they are today, but were capable of sliding inward seven and three-quarters inches from the ends of each axle. While running on their home line tracks they were locked in place with a pin located behind the wheel, toward the truck center.

While a train was crossing the river on the ferry, the pin behind each wheel was removed, leaving the wheel free to move inward on the journal. Leaving the ferry on the American side, the track, with guard rails to prevent a derailment, gradually narrowed down to standard gauge, so that when the car moved forward the wheels were forced inward to conform to the lesser track width. They were then held in this position by a shoulder on the axle on one side and the pressure of the flange against the rail on the other.

Despite his 77 years, MR. DWYER recalls scores of interesting experiences and incidents which have occurred since his birth in Montreal, June 26, 1854. At that time his father was a partner in a trucking firm which owned and operated delivery wagons in that city.

At the age of nine the boy was bound out to a farmer and builder at St. Rehme on the English River. Canadian farms were then of standard size, forty acres. Although his family then owned the fourth farm away, he was unable to live at home because his father could not support all of his fourteen children.

He soon found, however, that the farmer expected him to do all the work of an adult: he was required to load hay, water and tend a drove of sheep, 16 cows and yearlings, a team of work horses, a one-year-old colt, and a spring colt.

Ready-made shoes were not purchaseable then, either. Each fall the farmer sent a cowhide and a calfskin to the tannery and the following autumn they were returned in the form of leather. A shoemaker was subsequently called in to make everyday shoes for the entire household from the cowhide. and "Sunday" shoes from the calfskin, and although no particular attention was paid to the appearance of the work shoes thereafter, the "best" pair had to be cleaned and greased with tallow or fat every Saturday night to keep them soft and pliable as well as neat.

The job of "bootblack" was soon assigned to MARTIN and although he was willing to do all his other chores, he rebelled inwardly to this added menial task. One Saturday evening, while he was shining shoes, his brother called and told him that on April 9, 1865, the family was going to move into the United States. Together they formulated a plan for "smuggling" MARTIN into this country, unknown to either his family or his farmer-master, with the hope that he would not be returned to his bondage when he was discovered later on.

On the appointed day MARTIN was hidden in one of the wagons and a few hours later the sound of strange voices outside told him that his father was "entering" this country, an act then accomplished without customs searching or any other formality except signing a registration book in a small office at the national boundary. Once the border was behind them the brother exposed MARTIN and convinced their father that the boy should not be forced to endure the brutality of the farmer any longer.

In 1868, MARTIN, then fourteen, was employed by the Ogdensburg and Lake Champlain Railroad at Forest, N. Y., 25 miles from Rouses Point, where a supply of wood was kept available for the two daily passenger trains operating between Malone and Rouses Point. No locomotives he has seen since so fascinated him as the two wood-burning, American type engines, with bulging stacks and oil headlights, which pulled the daily mail and passenger trains over this line. They were named *The Deer* and *The Fawn* and covered the 55 miles of track at an average speed of 40 miles an hour. MARTIN had to pile wood close to the tracks so that the tenders could be loaded hastily while the trains stood at the station.

He worked intermittently for this railroad for three years and was given permanent employment in 1871 as a member of a section gang. When, in 1872, the gang's tool house burned down, he and another man were told to rebuild it. His work in this connection pleased the roadmaster so much that he was sent to Champlain to supervise the erection of a board fence near the canal terminal; when this was completed he was placed in charge of the gang which fenced in the line all the way to Ogdensburg, 125 miles away.

In 1872 he supervised the laying of the road's first "T" rail and by 1875 the changeover had been made on the entire line. A business depression in that year necessitated so drastic a curtailment of the force that MARTIN was temporarily laid off. A few days later he was offered a job by I. G. Bates, roadmaster at Plattsburg.

MARTIN'S promotion to the rank of foreman at the age of 20 came as a result of his natural curiosity to find out how machines worked. One Sunday he and James Welden were walking through the yards when they noticed a low-side gondola loaded with new "foot-lever" switches. He had never seen such a device before and therefore climbed aboard the car to see how they operated. After several hours' work he and his companion succeeded in setting one up properly and made it work.

A few days later the division engineer, a man named Greene, knowing that MARTIN had been a foreman on the Ogdensburg and Lake Champlain, sent for him when it was learned that none of the supervisors knew how to set up the new switches. MARTIN admitted that he had never put one of these switches into a right of way but that he "thought he knew how."

Given the opportunity, MARTIN assembled the switch and operated it to the satisfaction of the division engineer, who immediately offered a foreman's position to "the kid who showed his superiors how to do something they couldn't do themselves." MR. DWYER was therefore in a supervisory position with the Delaware and Hudson when the first regular train passed over our Champlain Division in 1875.

After serving as a Maintenance of Way foreman for 9 years at various points on the Saratoga and Champlain Divisions, MR. DWYER was promoted

(*Continued on page 306*)

Rail and Road Transportation *in* Great Britain

SO much has appeared in the press during the past several years regarding the effect of automotive transportation on the business of the railroads of the United States that it will be of interest to learn the extent to which this subject has been given consideration in Great Britain.

In April of this year the Minister of Transport appointed a Committee composed of Sir Arthur Salter, K. C. B., Chairman; Sir Herbert A. Walker, K. C. B., Chairman, General Managers' Committee, Railway Companies' Association, and General Manager of the Southern Railway, Sir Josiah Stamp, G. B. E., Chairman, London Midland and Scottish Railway, Sir Ralph Wedgwood, C. B., C. M. G., Chief General Manager, London and North Eastern Railway, and Sir James Milne, C. S. I., General Manager, Great Western Railway, representing the railways; and Mr. C. le M. Gosselin, M. I. A. E., Past President, Commercial Motor Users Association, Mr. P. R. Turner, Vice President, National Road Transport Employers Federation, Mr. W. H. Gaunt, O. B. E., Distribution Manager, Messrs. J. Lyons and Company, Ltd., and Mr. E. Graham Guest, J. P., M. A., B. Sc., President, Scottish Commercial Motor Users Association, representing the motor transport interests.

The questions to which the committee was asked to give consideration were:

(a) The incidence of highway costs in relation to the contributions by motor users;

(b) The regulation of freight transport by road and rail; and

(c) The equalization of competition between the two classes of transport, each being given its fair opportunity.

The Committee rendered a unanimous report on July 29, 1932. The object of the Committee was the ultimate establishment of a "fair basis of competition," tending to secure a better "division of function" between the transportation of freight by rail and road. They had the advantage of exhaustive studies as well as the views of highway authorities and of various bodies and associations.

General

THE rolling English road, often traced first in paths to meet the needs of the walker, then adjusted to the pack horse, widened for the later

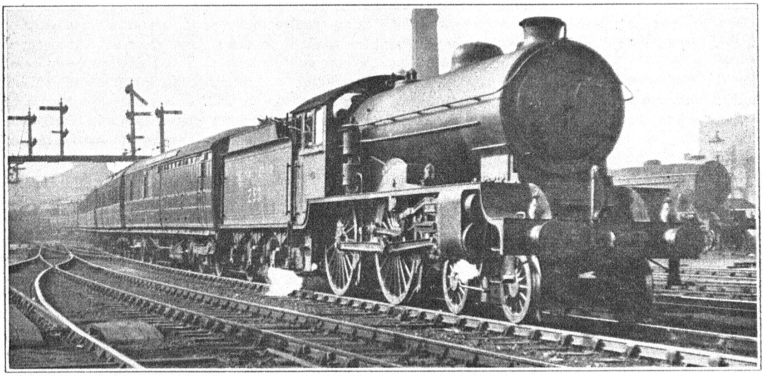


Photo Courtesy *Santa Fe Magazine*

London Express, London and Northeastern Railway coach, and macadamized for the increased wheel traffic of the last century, remains as the track of all but a small fraction of the modern motor roads. The road mileage now totals 176,791, and is used generally by about 1,000,000 private motor cars, 627,000 motor cycles, 364,000 trucks, and 87,000 taxicabs, motor omnibuses and coaches.

At the beginning of the present century the cost of construction and maintenance of the roads averaged about $58,400,000 a year. The present cost amounts to about $292,000,000 a year, considering the pound as worth par, or at its present gold value a cost of $207,300,000.

The rapid development of the transport system—one of the most fundamental factors in the economic and social life of the country—has raised many problems of adjustment—the safety of the individual, the disturbance of old amenities while new ones are created, the effects on adjoining properties, and the coordination of the different forms of transport service. Another problem was the possibility of retaining in permanent equilibrium two systems, the economic cost of service being the guiding principle of charge for one industry, and "what the traffic will bear" for the other.

Incidence of Highway Costs

IN the determination of the charges for highway maintenance, the Committee's conclusion was that the entire cost should be apportioned and assessed on the passenger cars, trucks, buses and motor cycles.

In considering the basis, the Committee took into consideration the "community uses," i.e., that the roads are used by pedestrians, ordinary cycles (of which the absolute number is greater than before motors appeared), by horse traffic, and by the State for the movement of troops; also that telegraph and telephone poles, water pipes, drainage pipes, gas pipes and electric cables, as well as tramways, are on the right of way. As against this, the present road users enjoy a very substantial legacy from the past in respect both of the road system existing before the motor era and of the heavy capital expenditure on the work of transformation during this era. The annual equivalent of such legacy from the past was obviously of considerable moment, but incapable of exact calculation. These two factors, each incapable of exact calculation and on opposite sides of the account, were considered as approximating closely in order of magnitude; that is, they might fairly be regarded as cancelling each other. The only fair principle then was to consider the total annual cost of the roads and distribute such cost according to a just estimate of the wear and tear caused by the various classes of users. They then considered that the total contribution payable by all classes of mechanically propelled vehicles, whether in the form of license duty or gasoline duty, should be equal to the current expenditure on the roads, without net addition or reduction in respect to "community uses" or "legacy from the past."

The average annual road expenditure was arrived at by taking the average annual expenditure for the five-year period 1927-28 to 1931-32, and, as stated, resulted in a net figure of about $292,000,000. In the allocation of this sum, representing the annual road cost, between the different classes of mechanically propelled vehicles, for the purpose of determining the amount which each class should pay as its contribution toward the total cost, three principal systems were examined:

(a) SPEED-TONS. This combined a "speed-ton" factor with the automatic incidence of the gasoline duty through gasoline consumption. It was proposed to determine the license duty for each class of vehicle by means of an index obtained by multiplying its tonnage by its normal speed per hour. The Committee came to the conclusion that this factor in itself did not give a satisfactory solution, because while the use and wear and tear of roads tends to increase with the speed, it does not follow that, even if other things are equal, they increase in an exact arithmetical ratio with speed.

(b) GASOLINE CONSUMPTION. Another system proposed was one based mainly upon gasoline consumption and the gasoline duties. The conclusion with respect to this system was that while it is an excellent measure of varying use and wear of the roads by different vehicles of the same general weight and description, it is a defective measure of varying use and wear by different classes of vehicles, due largely to the skill of mechanical engineers of recent years securing a greater result in work done in relation to gasoline consumption in the case of the heavier vehicles.

(c) TON MILES. The third basis considered was "ton-mileage" of the different classes of vehicles. This was done by ascertaining, on a system of averages, the laden tonnage of the vehicles in a class and multiplying this by the estimated mileage covered in a year. This system was considered insufficient in that it made no allowance for speed, for differences in range and character of road use. Evidence indicated that the heaviest classes involve some extra expenditure in road construction and maintenance, and some extra wear and tear beyond what would be involved in the passage of the same weight over the same distance in smaller units.

It was estimated that if there were no vehicles of more than four tons weight unladen, either for passenger or goods traffic, the annual road expenditure might be reduced by between 2% and 3%. If this is true of the class as a whole, it may be taken to be increasingly true with each increase of weight within the class.

Considering all the factors, the final conclusion was that a system of allocation based equally on ton-mileage and on gasoline consumption would be the most adequate general formula and would take all relevant factors into reasonable account.

The effect of this formula, after some slight allowance for greater wear due to speed, was to allocate the $292,000,000 on the basis of $114,370,000 to trucks and $177,630,000 to all other motor vehicles. Having made this allocation, the Committee then proceeded to prescribe a formula designed to distribute the cost among the different classes of vehicles. Under the present English license system a 10-ton vehicle pays no more in license duty than a 5-ton vehicle. Under the allocation on the ton-mileage-gasoline-consumption basis, as between the different sizes of vehicles (with the exception that vehicles exclusively employed within an immediate port area receive a rebate on the normal license duty of 25%) a 10-ton truck carrying miscellaneous freight, heretofore paying an annual license duty of $292, will, in the future, under the recommendation, pay an annual license duty of $1,372. For Diesel engine trucks of 10 tons, the license fee now $292, would be $1,788. For each trailer a license fee of $78 is added. Gasoline at present pays a tax of 8d. (about 16c.) a gallon, which the Committee recommended be continued.

The Committee felt that the recommendations could be taken as a fair basis of licensing for a period of five years, even though the actual road expenditure might vary from year to year. In the event of an increase in the annual expenditure, it was anticipated that such an increase would be attended by an increased number of vehicles, which, on the given basis, would bring in additional revenue.

As an appendage to the recommendations of the new license duties for motor vehicles, the Committee also recommended that the present legal obligations of the railway companies to maintain, at their expense, the road surfaces of bridges carrying highways over railways is anomalous and inequitable, and that the road authorities henceforth assume this responsibility.

Regulation

In considering the nature and extent of the regulations which, in view of modern economic development, should be applied to freight transport by road and rail, the Committee observed that the railways are subject to an extensive and meticulous system of regulation and supervision, which system has grown up in a period during which the railways, while competing with each other, enjoyed a large measure of monopoly. There was nothing in the form of effective competition at all comparable with that of the commercial passenger and freight transportation services which are now on the roads. As common carriers the railways are under obligation to carry goods at rates which do not discriminate between one person and another; the rates themselves being subject to control by a tribunal and must be published. Similarly, the arrangements as to wages and conditions of service are such as to give very effective protection of the interests of the railway employees: and the ability of the management to make changes is confined within narrow limits and subject to a complex procedure.

The Committee agreed that the conditions upon which competition should take place ought to be more on an equality, and its consideration was whether it should proceed in the direction of asking for greater liberty for the railways, or on the other hand of recommending certain public safeguards to be extended to the operation of the motor transport service.

The Committee recommended that present regulation of railway rates and present conditions surrounding railway service should continue and proposed no relaxation in either case. Further, that all trucks, common and contract carriers and private trucks (the last named do about 70% of the business), should be subject to regulation as regards wages of service and fitness of vehicle, the latter to be enforced through a licensing system.

Common and contract carriers are to be regulated on the principle of "public necessity and convenience," to be controlled by the Minister of Transport with the aid of a permanent Central Advisory Committee. Rates of carriage need not be published, but the licensing authority may require them to be reported to him.

Equalization of Competition

The Committee supports the views of the Royal Commission on Transport that it is not "in the national interest to encourage further diversion of heavy freight traffic from the railways to the roads," and recommended that the Minister of

(*Concluded on page 306*)

Soho, An Early Experiment in Industrial Organization

PART III—PIECE-WORK AND PERSONNEL PROBLEMS

September and October *BULLETINS* contained the first installments of the description of Boulton and Watt's establishment in Birmingham which was the fore-runner of our present-day industrial marvels.

SCIENTIFIC Management," says Marshall, "is in the main a method of redistributing and reorganizing the functions and mutual relations of the personnel of a great business, with the purpose of increasing aggregate efficiency by narrowing the range of responsibility of its employees and bringing careful studies to bear on the instructions given in regard to the simplest manual operations."

Soho qualified under this definition of a scientifically managed plant. By first analyzing their problems and collecting statistics the younger Boulton and Watt were able to draw conclusions which led to their decision to extend and reorganize the existing plant. Although manual work was still resorted to for the finer operations "it can, nevertheless, be stated that Soho was a scientifically planned factory, manufacturing steam engines by machines driven in their turn by steam power.

Piece-Rates

"It has been stated that weekly wages were paid at Soho during the earlier years; and this is, on the whole, true. The comparative advantages of piece-rates over a set wage, however, received some attention. Boulton first raised the question in 1778. 'Query,' he wrote to Watt, 'if it would not be better to persuade Joseph Horton to undertake the work by the pound.' And in the same letter he reported that he was negotiating a new piece-rate with another workman named Hall. He desired him to agree to a rate equivalent to $7 per valve for all nozzles of cylinders with a diameter of over 50 ins., and $5 per valve for all nozzles of cylinders below 50 ins. '............'Tis nearer,' he added, 'what they should be than day work will make 'em.' It has been impossible to ascertain whether this rate was actually agreed upon; but the interest which this question aroused would probably justify the conjecture that to some extent piece-rates were in operation at that time.

"The application of a piece-rate was then, as now, restricted to those articles which had reached a certain degree of standardisation and which were easily classified into various groups. Founders and casters were usually paid according to output, and this custom was adhered to at Soho when the foundry was built. From 1795 onwards, therefore, the percentage of workers on a piece-rate increased. As far as smiths and engineers were concerned, we could only expect an increase in the range of operations to which piecework was applied with an increase in the number of articles manufactured.

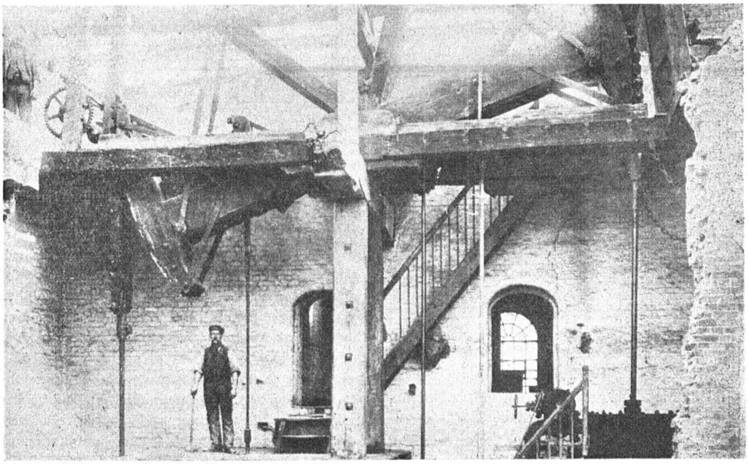
"The lists of the piece-rates at Soho Foundry of 1800 when compared with the distribution of workmen in 1801, show how the pace of improvement had been increased. The specialisation of labour had, within that one year, been carried out to a surprising degree as a careful comparison of these documents shows, one particularly striking example being that of one Bunting whose jobs, from a variety enumerated, were reduced to that of fitting parallel motions only."

By fixing standards of payment for each operation "the firm succeeded in making an exceedingly profitable bargain. The cost of fitting certain sizes of engines was reduced to a permanent standard, a very important preliminary for a sound system of costing. In the second place this standard was in all probability lower than the average cost hereto of fitting these engines. The average for the five engines chosen is over 21 pounds, and there is every reason to suppose that the firm exercised its bargaining power to fix the figures as low as possible.

"Above all they had in this way introduced what was, from their point of view, an excellent incentive for speeding-up the work. The foreman would be willing to agree to a somewhat low figure because he had in any case a certain daily wage and was, under the new system, enabled to earn more since he would pocket all the gains obtained through speedier work. The other workmen were not consulted but were left to receive their usual wage which varied between 41 and 60 cents a day. They would realise only later that through this new system, although their money wages remained the same, the speed, intensity, and regularity of their work was considerably affected. Then, as to-day, their only safeguards against any excessive speeding up were the limitations imposed by purely technical considerations; and it is to be assumed that the strictness of the irksome factory routine would increase in proportion to the decrease in the number of manual operations required. As long as castings remained faulty, as long as turners, drillers, and borers turned out work which had to undergo a number of adjustments at the hands of the fitters, and, above all, as long as most of these adjustments could not be done by the aid of machinery, the skilled fitter being at the same time very scarce, the obstacles in the way of speeding-up production by a mere intensification of labour were very formidable indeed. Variations in the time taken over different jobs were not easily subjected to control, and although, in the case of the fitting of one particular part, the foreman was able to increase his earnings considerably, it is likely that in the case of the more complex task of the fitting of the entire engine his power in this direction was limited."

"How strong an incentive a 10 per cent or 16 per cent output bonus was it is difficult to say. That the system was intended as an incentive to increase the output there can be no doubt. It can certainly be described as one of the systems of payment by results all of which are primarily intended to act as incentives. The system had, at any rate, the advantage of being straightforward, and was one which could easily be understood by the workmen who were given their usual time wages plus an additional bonus per unit of output which would, in however small a measure, have induced a certain intensification of production. Even to-day, when an enormous number of bonus, premium-bonus and efficiency systems are used in industry, a recent writer with great practical experience seems to favour this simple method and quotes another authority in support, mentioning the extremely successful results of 'a scheme which gave to the actual producers a bonus on output, superimposed on plain time-rates' introduced at the National Factory, Cardoland."

"The mere fact that new and more elaborate methods of wage payment were later devised shows that, with all the other changes at Soho, had come also a gradual but complete change in the attitude to labour and, consequently, in labour conditions. During the earlier years of the steam engine business the type of labour required and its scarcity were such as to impose certain limits to the wage-fixing power of the management even if it had desired to pay as little as possible. Custom in the case of scarce and highly-skilled engine men would be as strong a wage-fixing factor as the strongest trade-union action of to-day; and although Boulton & Watt, as good and individualist business men, would certainly endeavour to strike as hard a bargain as possible in taking on workmen, they would nevertheless submit to customary figures. It has been shown that the nature and degree of the development of business organisation attained during the years of the older management were not favourable



Early Pumping Engine of Boulton and Watt to the organisation of a production both technically and economically efficient. Wages were, therefore, more or less left to find their own level in a haphazard way.

"This indifference to modern management problems is often taken as a sign of the greater benevolence towards the workers where there is a 'good' individualist master. Boulton certainly deserved that attribute in the light of the views and practices of his period, and during the time that the Soho business was under his personal care, the conditions of the workers were certainly more favourable than were those obtaining in many of the industries of the 'industrial revolution' and in Soho after 1800; but it is at least doubtful whether this was due to a more benevolent master or to a less developed business organisation. Boulton's own attitude towards the workers, so typical of 'paternalism,' is well expressed in his speech at the opening of Soho Foundry:

> 'As the Smith,' he said, 'cannot do without his Striker, so neither can the Master do without his Workmen. Let each perform his part well and do their duty in that state which it hath pleased God to call them, and this they will find to be the true rational ground of equality.'

First Strike

"The close personal contact between master and men and, much more so, a factory discipline which was still lax, seems to have resulted in fairly smooth relations between the firm and the workmen. At any rate, no evidence of any disputes appears during the early years of the steam engine business. Whatever unpleasantness there was, arose on grounds such as drunkenness, inefficiency, and bad workmanship.

"The first serious dispute was in 1791 when the engine smiths struck. The strike seems to have arisen out of difficulties over the settlement of certain piecework rates caused by the fact that Roberts, a clerk of the engine firm, had left and his account book could not be found. Boulton settled the strike, which seems to have lasted but one or two days, very quickly, and for some years nothing in the nature of a dispute is mentioned."

"In honour of his son's coming of age Boulton gave an entertainment, at which over 700 people were present, to all his workmen, their wives and children," says the Birmingham Daily Post, April 30, 1863.

Cost Accounting

No description of Boulton and Watt's organisation would be complete without reference to the system of book-keeping and cost-accounting which grew up of necessity.

The original arrangement whereby premiums were paid in proportion to annual fuel savings made by the early pumping engines was greatly simplified when the firm turned to the production of rotative engines, standardizing on fourteen sizes ranging from 4 to 50 horse-power, each of which sold for a fixed sum depending on the horse-power.

"The method of price fixing naturally reacted on the costing and book-keeping system; and in this respect, too, Soho appears to have been far in advance of the time. The books had always been kept in a very thorough manner. There were the usual goods accounts and personal ledgers, and we have seen that the trading accounts drawn up annually, although they do not convey all the information desired, can compare quite favourably with modern practice. The change in the organisation following on the taking over of the manufacture of steam engines, which brought about a splitting up into departments, tended to raise the standard in the methods of accounting. To cope with the changed conditions, a great number of new books of a statistical character had to be started, and this, it seems, was a very uncommon thing in contemporary business practice.

"The purpose of keeping elaborate records of costs is twofold. In the first place, they provide a basis for the drawing up of estimates for future contracts, and in the second place, they enable a firm to ascertain accurately the profit realised on each completed contract.

Preventing Waste

"In the same way as in any well-organised factory of to-day, the purpose of keeping statistical records at Soho was mainly for the detection of waste and of lack of efficiency. When new methods of wage payment were being devised, recourse was had to the elaborate time-sheets for different shops. Thus these time-sheets fulfilled four objects—they supplied a basis for ascertaining the workers' wages for the job; they were used in the calculation of the costs of engines; they could serve as the starting-point for changes in the methods of production, such as speeding-up and greater application of machinery; and, lastly, they were used, as already mentioned, in the computation of new wage-rates. In a similar way, most of the other departmental records of indirect charges, wages bills, etc., were used for maintaining a standard of efficiency.

"In general, it may be stated that all the different aspects of the great changes at Soho were strictly co-ordinated and were, consciously or unconsciously, parts of a general and very elaborate plan of the new business organisation. In many ways the statistical tables, the calculations and the account books which have been preserved seem to exceed the limits of reasonableness in this respect for the time and for a business of the size to which they refer. It is generally and justly assumed that the usefulness of elaborate methods of cost-accounting diminishes proportionately as the size of the business to which it is applied diminishes, and that the benefit of comprehensive and expensive schemes of this kind to small concerns is extremely doubtful.

Inventors vs. Manufacturers

"The Watt engine was designed originally without reference to the possibilities of its practical applications. It was a theoretical invention, and the possibility of applying it to practice was demonstrated only after protracted and laborious experiments on a small scale, and these did not definitely establish it as a 'commercial proposition.' Unlike his predecessors in the engine field, Watt pad no attention to the insufficiency of the executive skill and machinery available at the time; and not the least of his achievements is the fact that, by demanding the seemingly impossible, he created and stimulated forces which made it ultimately possible.

"Since the organisation of Soho during the first period of its history does not differ largely from the general conception of eighteenth-century business organisation and practice, it is to the second phase that we have to turn for the material for our conclusions. To be sure, even under Matthew Boulton and James Watt, Soho was an exceptional enterprise; but what distinguishes those twenty years from the following five is the absence of any deliberate preconceived, and recorded attempt at efficient organisation in all its aspects. Boulton & Watt had made steam engines a commercial possibility. Their successors manufactured them. The fathers had been builders, the sons were organisers; and, although the older generation had laid the foundations, the new built a superstructure of such unique elaboration that it becomes difficult to balance the merit of the two generations. 'For large inventions and other advancements,' says Marshall, 'are seldom completed by a single man; and not always by a single generation. In fact they are often named after those who have planted the flags of conquest on the crests of the battlements; while those who led the way, but did not live to partake in the ultimate victory, are forgotten.' This has certainly not been so in the present instance, and it is time that a revaluation was made and due credit given to Matthew Robinson Boulton and James Watt, Jr.

Not a New Science

"The first impressions of an account of the experiments in business organisation carried out by this firm tend to evoke a desire to revise the general belief in a comparatively recent introduction of such experiments which have lately been invested with all the glamour of a science. It is commonly supposed that problems such as those of scientific works design, subdivision and specialisation of labour in conformity with the greater use of machinery, more accurate methods of wage payment, keeping of records and of systems of cost accounting did not arise until thirty or forty years ago during the era of what is termed the 'new industrial revolution.' Mass production, with its use of automatic machinery, is made responsible for a revolution in industrial methods with social repercussions equally or even more profound than those of a hundred years ago.

The history of Soho does not encourage such generalisations; and even when it is admitted that Soho was an exception—although the lack of evidence regarding other enterprises may be due merely to the absence of records—the presence of experiments in scientific management shows that these are not exclusively a product of the era of mass production but were apparent from the very beginning of machine industry. The problems, partly technical and partly economic, which evoke them to-day were in evidence then; and there is no reason to assume that the degree of common sense required to solve them was not as easily forthcoming one hundred years ago as it is to-day, even though it was not then systematised into science.

"The procedure adopted to solve problems of organisation and administration was, taking them one by one, in no way different from that laid down by management experts at the present time; and the cause necessitating changes was then, as now, mainly economic. Demand pressed on supply; and the assurance of an extensive and steady market stimulated inventive ability. The machine-designer was called into play, and it was not long before he had improved or invented such machines as were required to ensure regular satisfaction of the demand. Once, however, the technical expert became of importance in industry his part assumed

(Concluded on Page 306)

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Index to 1932 *Bulletins*

AN index of the articles appearing in the issues of *The Bulletin* during the year 1932 has been prepared and copies will be sent to readers on request. To secure a copy, address Supervisor of Publications, Room 905, Delaware and Hudson Building, Albany, N. Y.

Pleasure or Happiness?

THE grasshopper, if it could talk your language, could tell you the meaning of pleasure; the plodding ant could define only contentment. When the sun is high in the heavens, when the breezes are warm and gentle, when the fields are embroidered with gorgeously colored wild flowers and the air is a blend of delicate perfumes, the grasshopper skips its life away. It is enchanted by the gladness of the hour and hasn't a care about the morrow. With a mixture of pity and scorn the grasshopper watches the ant ceaselessly toiling.

But the summer quickly passes and the snows fall where the flowers and the delicious grasses made life sweet for the grasshopper. Then a home is appreciated, but the happy-go-lucky grasshopper hasn't any.

The human drifter is likely to confuse pleasure with happiness and experience the grasshopper's fate. For without responsibility no life is complete. There is an instinctive longing in every one of us that can find satisfaction only in service.
—*Selected.*

The Priceless Gift

O'ER and o'er at Yuletide, in far-off romantic Persia, is told the parable of the man who journeyed one day to the Pearly Gates, seeking rest from his weary toils. He was met by a guardian angel who told him that he could not enter except he brought earth's most precious possession.

Back to earth the man went, pondering long as to what could be earth's most precious treasure. Surely, he reasoned, it must be the matchless jewels in the crown of Cyrus, the great King. So he searched until he found the dazzling diadem, set in gold, and bore it to the portal celestial.

But the angel scorned it, saying: "The streets of this city are paved with gold, and precious stones are its walls. You must bring something better."

Away the discomfited mortal sped again, convinced that, since wealth availed not, power surely would. In time he returned with the sword of Alexander the Great, the symbol of completest conquest, unbounded in the hope of finding favor with the guardian of the gate.

"Alexander is dust," sorrowfully replied the angel, "and the least of our messengers slew him in his frailty and shame. Earth's strength is but a weakness before heaven's gate."

Rebuffed, the man gave himself to thought for a long time, and eventually returned with the lost Books of Wisdom of Solomon, for, reasoned he, "It is wisdom that wins with the celestial sentry."

Shaking his head, the angel said, "Man's wisdom is idle folly in heaven, where all things are known. You must bring a gift far more precious."

The man once more returned to earth and ranged far and near, but in vain. He could find nothing precious enough to take to the Pearly Gates. So he resolved that he would return to the angel and confess his failure, and accept his doom.

On the way he passed a poor, broken, bleeding beggar by the roadside, and he stopped to minister to him, weeping in sympathy the while. He was still weeping when he reached the angel's presence.

Before he could tell of his failure, the angel stretched forth his hand in joy, exclaiming, "You have brought it! There it is!"

"Brought what?" asked the bewildered suppliant; "I have come only to confess that I can bring nothing!"

"But see!" cried the angel, picking a glistening pearl from the man's cheek; "you have brought earth's most precious thing—the priceless pearl of compassion. Enter in and accept thy reward!"
—*Adapted from William T. Ellis.*

Group Life Insurance Payments

PAYMENTS of $7,800, $7,000 and $5,800 to beneficiaries of Delaware and Hudson Group Insurance policies are to be found among the 38 claims settled during the months of August, September, and October. These substantial sums represent protection afforded two enginemen and a conductor under the Special Insurance provided by the Group Plan.

The total of $73,352 includes, in addition to insurance under the regular life policies, one payment covering Accidental Death and Dismemberment and a balance due under the Permanent and Total Disability option.

Individual payments were made as follows:

NAME	OCCUPATION	LOCATION	DATE DIED	CLAIM
Alden, M. Lee	Foreman	Binghamton	8-5-32	$2,000
Barager, Ralph	Box Packer	Carbondale	7-21-32	***852
Brimmer, Charles (P)	Trucker	Albany	8-23-32	1,000
Bryden, John A. (P)	Engineman	Nineveh	8-21-32	2,000
Cassara, Sebastino	Car Repairer	Oneonta	2-8-32	1,400
Coleman, Martin A.	Engineman	Colonie	8-29-32	**7,000
Condon, David	Clerk	Albany	8-8-32	1,400
Coon, J. Whitford	Teleg. & Clerk	Lanesboro	10-10-32	1,000
Deguire, Alfred	Punch & Shear Opr.	Colonie	9-15-32	1,600
Dibble, Frank S. (P)	Agent	Ushers	8-18-32	1,600
Dolder, William	Trucker	Albany	8-27-32	1,000
Driscoll, Cornelius (P)	Crossing Watchman	Green Island	8-29-32	1,000
Finnigan, James P.	Agent and Telegrapher	Peru	10-5-32	1,600
Fix, John	Stationary Fireman	Albany	10-4-32	1,000
Glorio, John	Crossing Watchman	Saratoga	10-16-32	1,000
Graham, George S.	Machinist	Carbondale	9-29-32	3,400
Green, William W. (P)	Coach Repairer	Colonie	10-18-32	2,200
Hall, George T.	Trucker	Albany	9-11-32	1,200
Hartwell, Ferond B.	Crossing Watchman	Hudson Falls	8-19-32	1,400
Hughes, George W.	Light Weighmaster	Carbondale	9-6-32	1,000
Isabella, Janette	General Foreman	Oneonta	8-15-32	2,200
Mann, Benjamin F. (P)	Shipping Clerk	Wilkes-Barre	10-9-32	1,400
McLaughlin, John D.	Trainman	Binghamton	10-3-32	1,000
Messenger, Alexander (P)	Conductor	Carbondale	8-14-32	2,400
Morris, Arthur W. (P)	Storeman	Whitehall	8-24-32	1,000
Moseley, Henry L.	Signal Maintainer	Windsor	10-20-32	2,200
Mosher, Sylvester	Crossing Watchman	Mayfield	8-2-32	500
Nugent, Michael J.	Assistant Engineer	Albany	9-13-32	3,600
Peters, Manuel	Trackman	Centre Village	9-22-32	1,000
Robbins, Charles	Engineman	Binghamton	8-2-32	**5,800
Rounds, Harvey M.	Conductor	Carbondale	7-30-32	* ****7,800
Siebold, Charles (P)	Crossing Watchman	Carbondale	9-17-32	1,400
Smith, William H. (P)	Crossing Watchman	Saratoga	10-8-32	2,000
Spaulding, George T.	Baggageman	Cambridge	9-14-32	1,400
Stefanick, Andrew	Crossing Watchman	Plains	7-24-32	1,000
Swint, William	Car Cleaner	Wilkes-Barre	9-30-32	1,000
Tucker, Austin (P)	Foreman	Lake George	10-1-32	2,000
Van Patten, Silas (P)	Pumpman	Duanesburg	7-17-32	1,000

(P) Pensioned Employe.

* Includes payment made under Accidental Death and Dismemberment Insurance.

** Includes payment made under Engineers' Special Life Insurance.

*** Balance under Total and Permanent Disability Insurance Claim.

**** Includes payment made under Conductor's Special Life Insurance.

"A Cheerful Giver"

To make sure that he would not be forgotten, Bobby ran to his little bedroom corner just before Christmas, closed his eyes, and said: "God, have Santa Claus bring me an engine, a sled, a ball, lots of games, and a pony and cart and saddle; and remember, God, that the Lord loveth a cheerful giver."—*Joys.*

Rail and Road Transportation

(*Continued from page 299*)

Transport be given power to prohibit by regulation classes of traffic which are borne by rail and which, having regard to the character of the commodity and the distance together, are unsuitable for road haulage, from being transferred in future to the road.

In the main, the Committee conceived that transportation will divide itself between road and rail as the demand of those who require it, and the facilities offered by those who provide it, determine.

It is their belief that the best division of function will be obtained mainly through the deliberate effort of those engaged in road and rail transport to coordinate their services and give the public the full advantages of complementary service.

The motor haulers on the one hand and the railways on the other are essentially two branches of the nation's common carrier service. For local collection and local delivery, and for conveyance up to a distance which varies with the nature of the traffic, road transport has its undeniable advantages. Beyond a certain distance, for certain classes of transport service, railway transport is no less unquestionably preferable.

Soho

(*Continued from page 303*)

an ever-growing dominance, and his postulates, no less than those of the business man, would tend to mould industrial organisation. Although it is true enough that 'changes in business organisation revolutionised machinery,' it must not be forgotten that in the second place the reverse would also be the case. In the designing of the works the engineer demanded avoidance of waste caused by intervals in the production processes. Soho was planned accordingly; and if the difference between its layout and that which conforms to modern theories should be taken as an indication of less efficiency, it must be pointed out that it went as far as the contemporary degree of the development of industrial technique demanded. The degree of application of machinery cannot serve as a basis of comparison. Soho was essentially a machine-operated concern, limited, of course, by the resources of the time. It possessed all the features of machine production, and the finished article which it produced arose 'thanks to a series of interdependent processes and manipulations.' This fact is substantiated by the results which the mode of production had on the class of labour employed; and it is, perhaps, in this respect that the Soho of 1800 presents the most striking contrasts both to itself before that date and to the usual broad generalisation concerning the period."

In conclusion the author says:

"The optomist will point with pride to the energetic methods adopted once the firm's position was challenged; and he will apply this example to the reorganisation of a pioneer country which has since lost its predominance. The sceptic, on the other hand, may be forgiven for being confirmed in his nothing-new-under-the-sun attitude. He will prefer to emphasise the fact that there is, after all, little originality in scientific management, and this, he will maintain, must seriously detract from its curative value. He will, therefore, be inclined to question the wisdom of those who regard efficiency alone as the panacea for the ills of the industrial system."

Smuggled Into This Country

(*Continued from page 296*)

to the rank of Track Supervisor on March 1, 1884.

Mr. Dwyer is recognized as an authority on the history and development of railroad rights of way and the expression, "If Mr. Dwyer said so, it is right!" is heard repeatedly.

Today his recollections of events which took place during and prior to the Civil War are as clear as if they had occurred but yesterday. Nor have advancing years detracted from his ability to devise and construct mechanical devices and small items of furniture. Scattered about his home and yard at 3 Lafayette Street, Green Island, are numerous chairs, benches, flower boxes, and other things which he has made during the past 15 years. Few property owners can surpass the pots, bushes, and arbors of flowers which make his residence unusually attractive.

Mr. Dwyer has two sons in the employ of The Delaware and Hudson: Francis M. is a Maintenance of Way Department Foreman on the Saratoga Division, and William J. is Motive Power Department Foreman at Lake Placid, N. Y.

Too Much to Ask!

The doctor had just been visiting an Irish patient, and as the man's wife was showing him out he said to her: "Your husband's not so well today, Mrs. Maloney. Is he sticking to the simple diet I prescribed?"

"He is not, sorr," came the reply. "He says he'll not be after starvin' himself to death just for the sake of livin' a few years longer."

Clicks from the Rails

First on Vatican Railroad

The first locomotive to operate in the Vatican City is of American manufacture. Originally one of a consignment of fifty shipped to Italy for service during the World War it was later assigned to handling royal trains. Now, shorn of its former glory, including cow-catcher, bell and the full-throated whistle which has been replaced by the typical European "squealer," it is assigned to switching duty. This accounts, however for its latest distinction. Truly, the last shall be first.

✣

World's Smallest Locomotive

Probably the smallest working model of a locomotive is that shown at the Model Engineering Exhibit at Westminister, England, by L. R. Beale, a British mechanic. One inch long, the model, which is propelled by an electric motor weighing ¼ ounce, will pass through a wedding ring used as a "tunnel." Perfect structural details down to the tongue of the bell and the flange on the smokestack are only visible under a powerful magnifying glass.

✣

Europe's Longest Bridge

More than two miles long and towering 87 feet above the water below, the longest bridge in Europe is to cross Masned Sound between the islands of Zealand and Falster. Built by an English firm for the government of Denmark the bridge will cost $10,000,000, carry railroad, highway, and sidewalk, and take three and one-half years to build.

✣

Box Car Corn Cribs

Discarded box cars are being sold to farmers in the Middle West for use as corn-cribs, sheds, etc., at $10 each. A car 40 ft. long, 8 ft. wide and 9 ft. high will hold 900 bushels of corn.

See Their First Train

The five Harkey brothers, employees of the Atlantic Coast Line at Sanford, Fla., were raised in the hills of North Carolina. They had never seen a train, so their father told them if they would work hard that week, he would take them over to the newly-built railroad and they could see the train go by.

All the week the boys worked with all their might. Saturday came, and they started out for the railroad, some miles away, in a two-horse wagon. Arriving at the railroad they unhitched the mules from the wagon and tied them to nearby trees, to wait until the train came by. They decided the wagon was too near the track, so the boys laid hold of it; two had the whiffle-tree, one the tongue, and two pushing.

About then the train came up behind them and blew. It scared the boys so, they ran away with the wagon and tore it all to pieces.—*A. C. L. News.*

✣

No Truck Competition

Seventeen coast artillery guns, each weighing 404,000 pounds, had to be collected from eastern seaboard forts where they had become obsolete for coast defense purposes, and moved to the steel mills at Weirton, W. Va. The railroads got the job and with each gun mounted on a carriage as long as three ordinary freight cars the Chesapeake and Ohio combined the collection into a fairly sizeable "scrap iron extra" for movement over their lines.

✣

Flagman Becomes Doctor

William F. Sayle, a flagman in the Illinois Central's Chicago suburban service, recently became a doctor of medicine. Mr. Sayle worked his way through medical school, meanwhile supporting his wife and three children and also finding time to play in the 144th Infantry Military Band.

Rude Awakening

Falling asleep when their car stalled on the "New Haven" tracks two motorists were awakened, uninjured, when a train hurled their machine down a 15-foot bank. A step was broken off from a west-bound passenger train which hit one end of the automobile a few moments previous to its destruction. Intoxication and unlicensed driving cost the somnolent motorists $105 and costs.

✣

One-Man Railroad

When the Minneapolis and Rainy River Railroad "folded up" and abandoned its 63 mile line built in 1890 for lumbering, the conductor, brakeman, flagman, machinist and handyman were no longer needed so Henry Bonniwell lost his job according to press reports. Charles Coonen who was a passenger on the first train over the line 42 years ago, also rode on the last trip.

✣

Albany Elevator's Fame

A recent issue of the *Union Pacific Magazine* describes a celebration in Abilene Kansas in which a float depicting the "World's Largest Grain Elevator" at Albany, N. Y. plays a prominent part. The J. B. Ehrsam & Sons Mfg. Co. of Enterprise, Kansas, supplied elevating and conveying machinery for the elevator which has a capacity of nearly eleven million bushels.

✣

Inlaid Checkerboard

An inlaid checkerboard containing 3,565 pieces of 12 different kinds of hardwoods has been made by a Union Pacific section foreman, J. R. Dellinger of Kent, Oregon, in three years' spare time. Each light square contains 64 pieces, comprising a miniature checkerboard.

THE spirit of the Brotherhood of Man was once most ably expressed by an ancient Chinese philosopher, who said:

"What I gave, I have;
What I spent; I had;
What I kept, I lost."